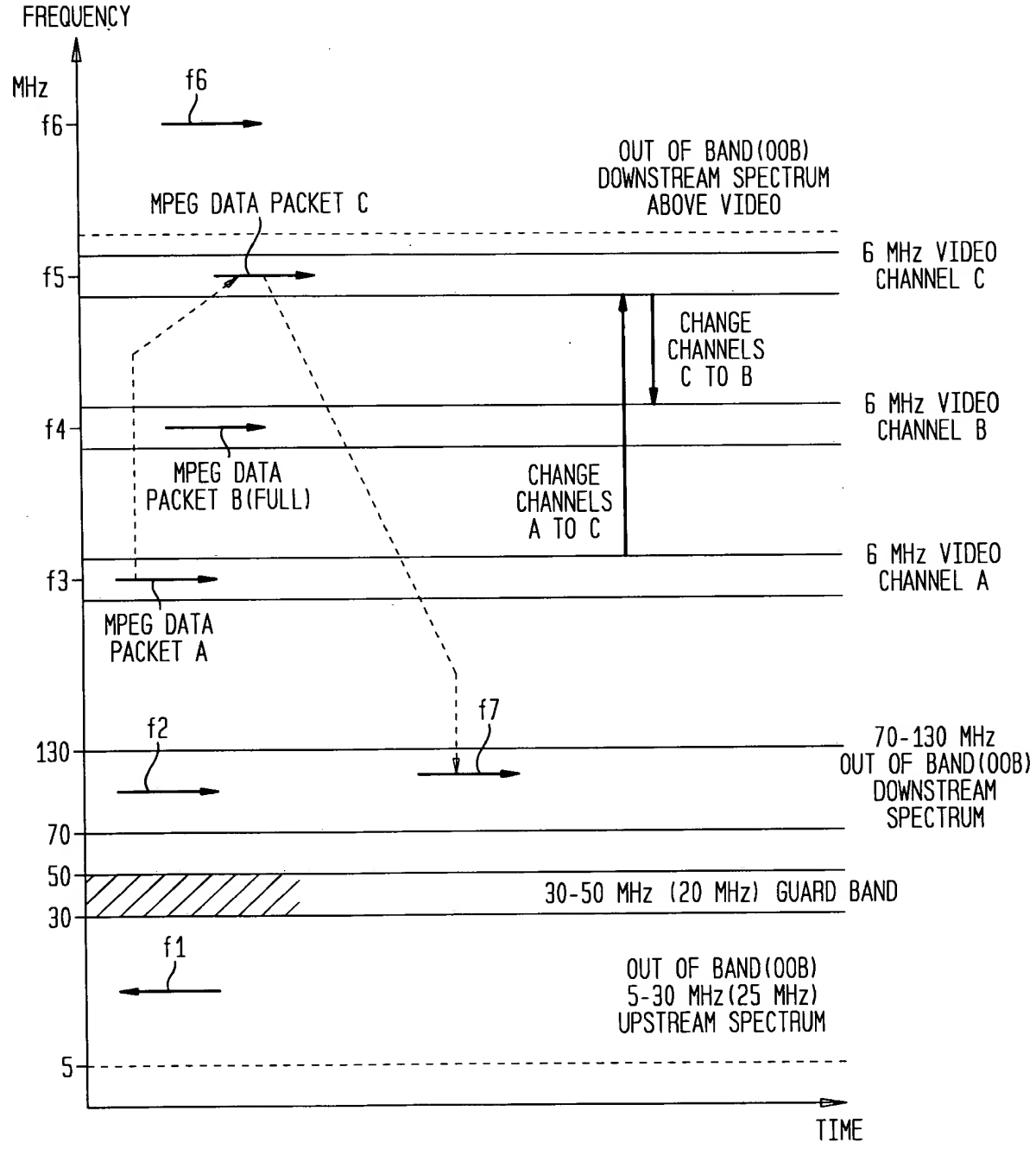
OIPE
JAN 04 2007
PATENT & TRADEMARK OFFICE

FIG. 1



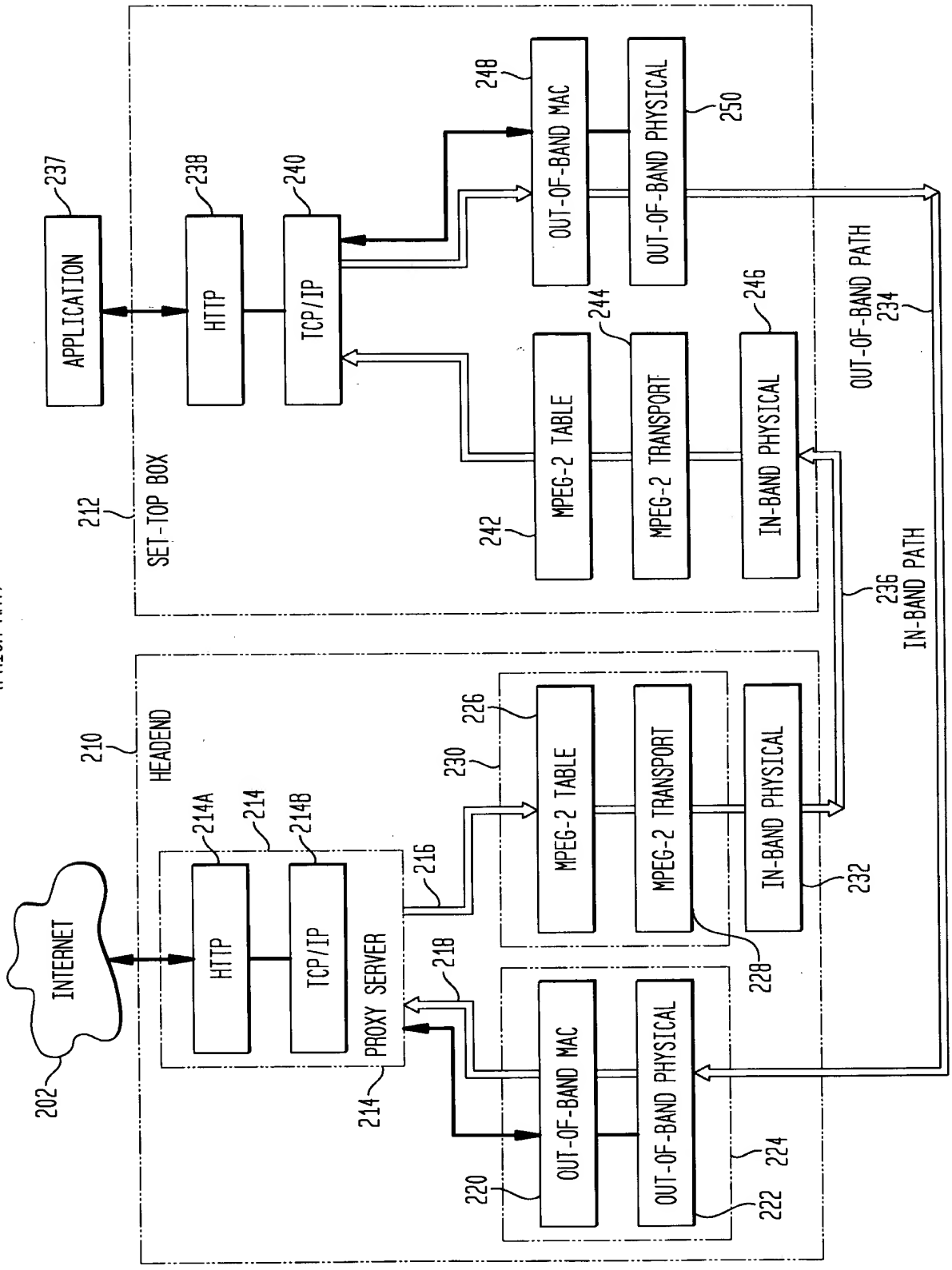


FIG. 2
(PRIOR ART)

FIG. 3

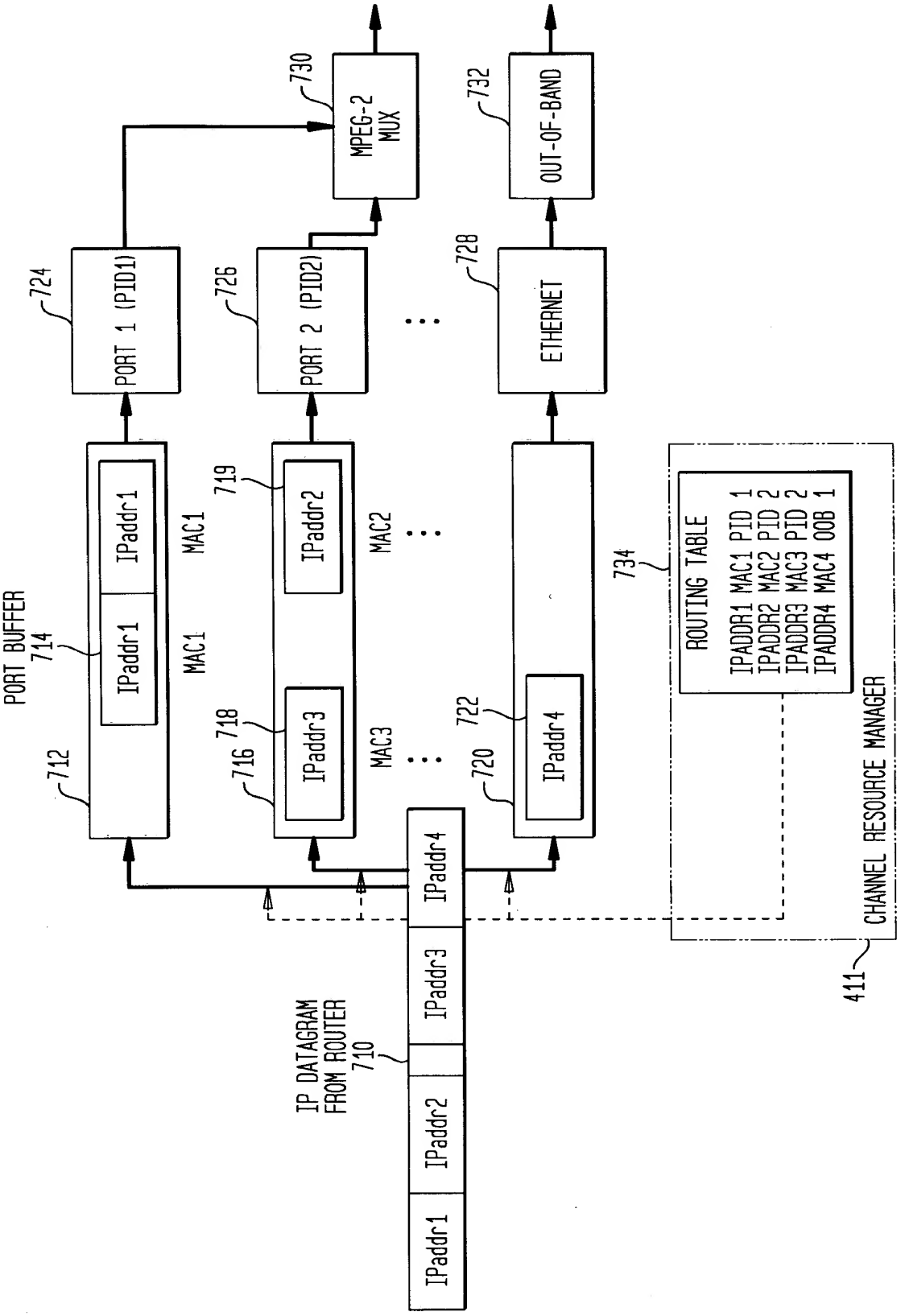

IP DATAGRAM FROM ROUTER
710
IPaddr1
IPaddr2
IPaddr3
IPaddr4
PORT BUFFER
714
712
IPaddr1
IPaddr1
MAC1
MAC1
719
718
716
IPaddr2
IPaddr3
MAC2
MAC3
722
720
IPaddr4
724
PORT 1 (PID1)
726
PORT 2 (PID2)
728
ETHERNET
730
MPEG-2 MUX
732
OUT-OF-BAND
734
ROUTING TABLE
IPADDR1 MAC1 PID 1
IPADDR2 MAC2 PID 2
IPADDR3 MAC3 PID 2
IPADDR4 MAC4 OOB 1
CHANNEL RESOURCE MANAGER
411

FIG. 4

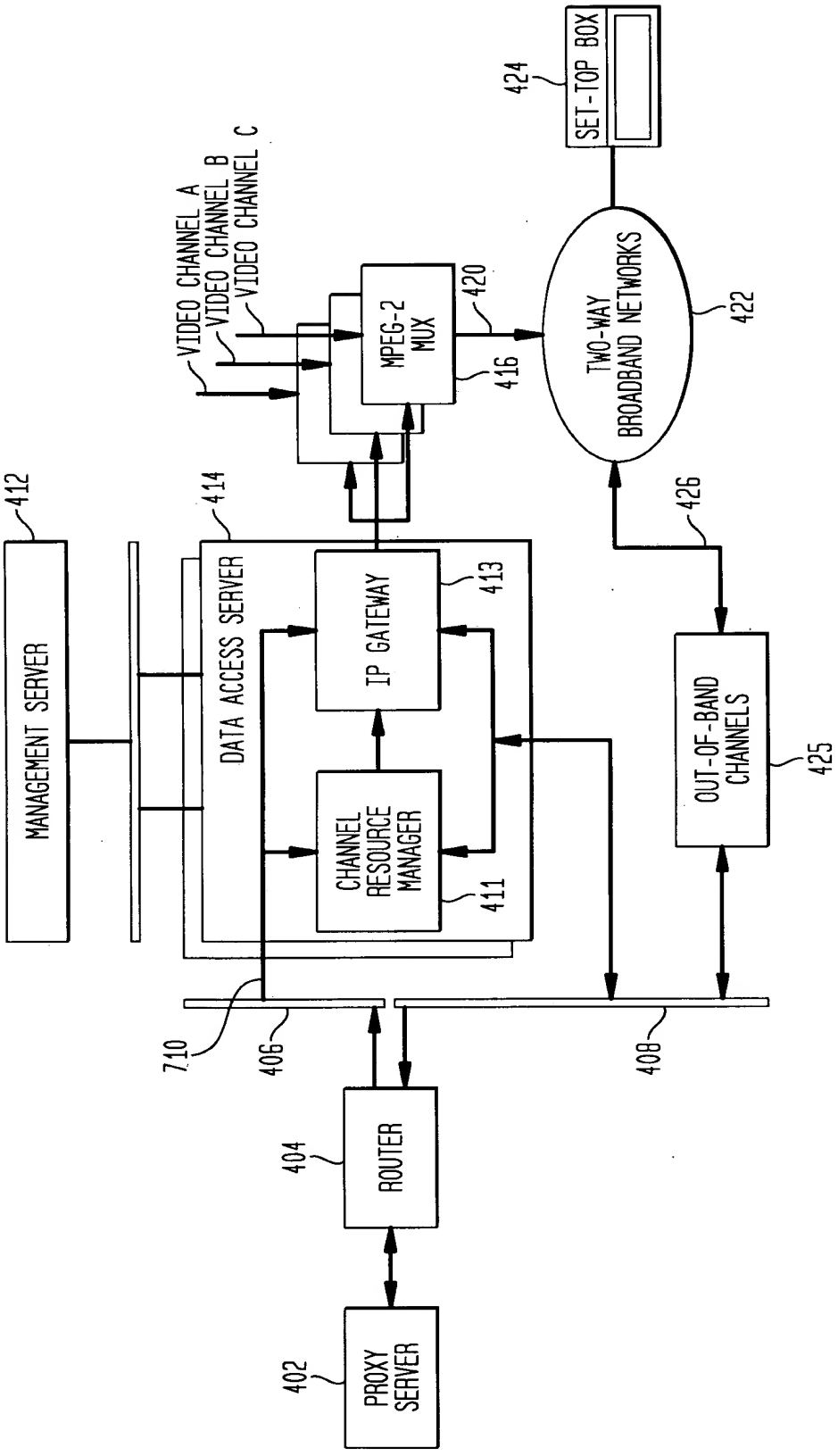

PROXY SERVER
402
ROUTER
404
710
406
408
MANAGEMENT SERVER
412
DATA ACCESS SERVER
414
CHANNEL RESOURCE MANAGER
411
IP GATEWAY
413
VIDEO CHANNEL A
VIDEO CHANNEL B
VIDEO CHANNEL C
MPEG-2 MUX
416
420
TWO-WAY BROADBAND NETWORKS
422
SET-TOP BOX
424
OUT-OF-BAND CHANNELS
425
426

FIG. 5

SIGNAL FLOW

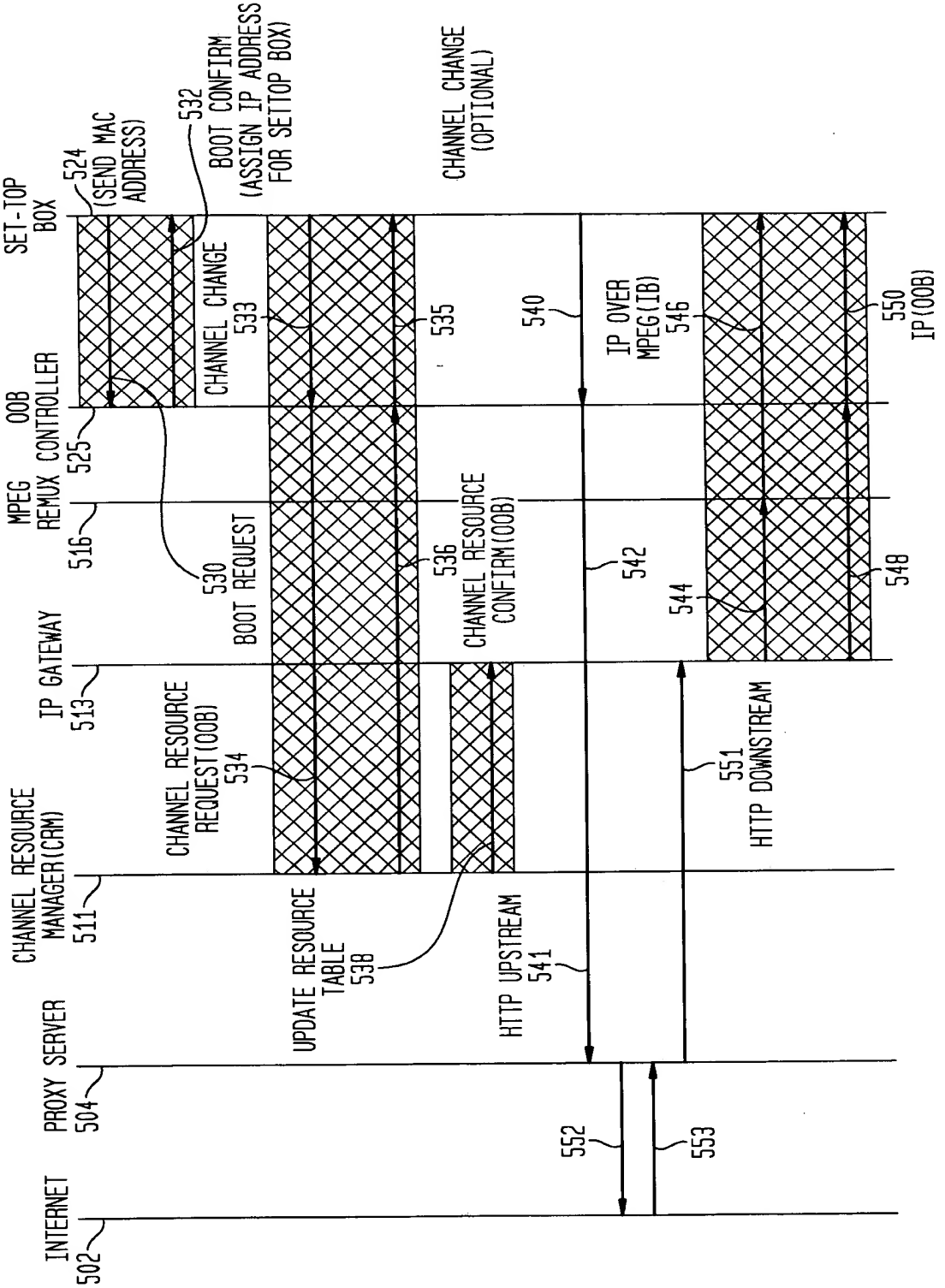
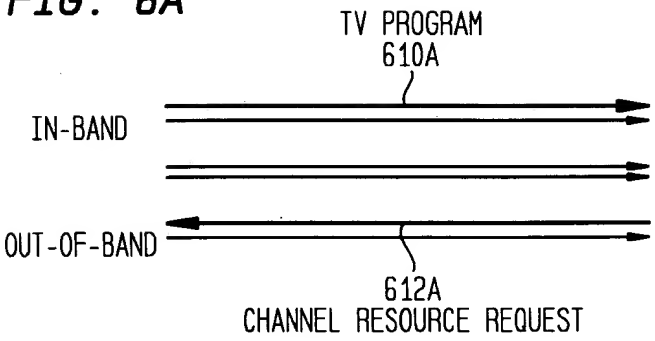
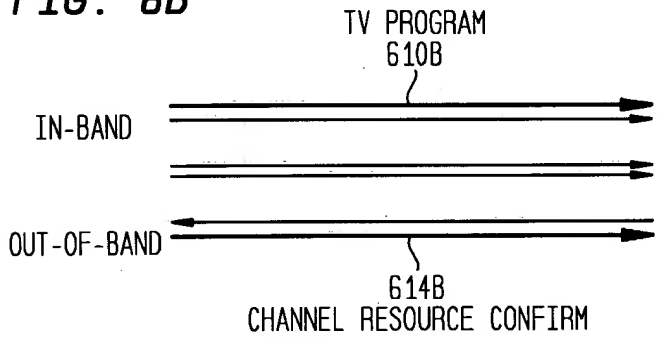


FIG. 6A



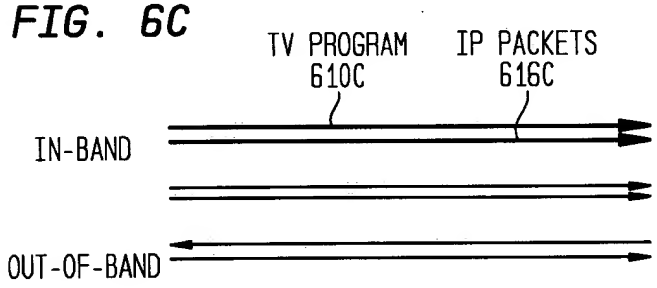
STEP 1 UPON CHANNEL CHANGE AND IP TRAFFIC STB SENDS CHANNEL RESOURCE REQUEST USING OOB UPSTREAM

FIG. 6B



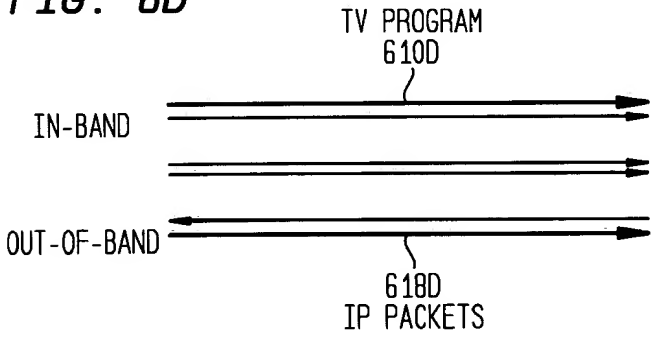
STEP 2 SERVER SENDS CHANNEL RESOURCE CONFIRM USING OOB DOWNSTREAM

FIG. 6C



STEP 3 SERVER ROUTES THE IP PACKETS TO THE RIGHT IN-BAND TRANSPORT

FIG. 6D



STEP 4 SERVER CAN ALSO ROUTES THE IP PACKET TO THE OOB DOWNSTREAM

FIG. 7

CHANNEL RESOURCE REQUEST MESSAGES

Channel Resource Request Message(){		
commonDescriptorHeader(){		
resourceRequestID	2	STB assigned ID for message
resourceDescriptorType	"0x0004"	PhysicalChannelResourceDescriptor
resourceNum	2	NOT USED
associationTag	2	NOT USED
resourceFlags	"0x42"	Use only current channel"non-Negotiable"
	(or "0x46")	(Can use any channel "Negotiable")
resourceStatus	1	NOT USED
resourceLength	"0x0006"	Total length of the descriptor
resourceDataFieldCount	"0x0001"	Only one resource descriptor
}		
PhysicalChannelResourceDescriptor(){		
channelID	4	programID(2)+transport_streamID(2)
direction	"0x0000"	(downstream)
}		
}		

FIG. 8

CHANNEL RESOURCE CONFIRM MESSAGES

Channel Resource Confirm Message(){		
commonDescriptorHeader(){		
resourceRequestID	2	STB assigned ID for message
resourceDescriptorType	"0x0003"	MPEGProgramResourceDescriptor
resourceNum	2	Assigned by server (0x8000-0x8fff)
associationTag	2	NOT USED
resourceFlags	"0x42"	Use only current channel"non-Negotiable"
	(or "0x46")	(Can use any channel "Negotiable")
resourceStatus	1	See status table
resourceLength	"0x0010"	Total length of the descriptor
resourceDataFieldCount	"0x0001"	Only one resource descriptor
}		
MPEGProgramResourceDescriptor(){		
mpegProgramNum	2	ProgramID
mpegPmtPid	2	TransportStreamID
mpegCaPID	2	NOT USED
elementaryStreamCount	"0x0001"	Only one data PID per TS
mpegPID	2	PID for the data "FFFF" for Out-of-Band
stream_type	"0x0D"	DVB Multi-Protocol Encapsulation
reserved	"0x00"	
associationTag	2	NOT USED
mpegPCR	"0xffff"	No PCR
}		
}		

REPLACEMENT SHEET